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EXAMINER	
HARRIS, GARY D	
ART UNIT	**PAPER NUMBER**
1785	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/541,096	CHOI ET AL.	
	Examiner	**Art Unit**	
	GARY D. HARRIS	1785	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 December 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,17 and 19-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,17 and 19-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/28/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/28/2010 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-12, 17 & 19-27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Independent Claims 1 & 17 now requires the anisotropic magnetic field strength of approximately 50 to 75 Oe. The specification does not teach this range.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-12, 17, 19, 20, 22 & 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi et al. JP 02-201904 in view of Fugimori JP 10-189322 A and further in view of Onuma JP 2002-158486.

As to Claim 1, Takeshi et al. JP 02-201904 (JP '904) discloses a granular substance (ferromagnetic particles) and a nonmagnetic insulating organic material (polymer). The ferromagnetic metal particles are dispersed in said nonmagnetic insulating organic material where a deposition of the polymer occurs between the ferromagnetic particles.

JP '904 does not disclose the particle size however; the resistivity shown is 180 micro-ohm-cm or more (similar to instant invention, abstract).

Fugimori JP 10-189322 (JP '322) discloses a soft magnetic granular substance in a nonmagnetic insulating material (Paragraph 0004) having a mean particle size of 10 nm or less (Paragraph 0012) in creating a film with high specific resistance and simultaneously reducing the eddy current loss.

It would have been obvious to select ferromagnetic particles from 5 to 15 nm in creating a film with high specific resistance. One would have been motivated to utilize the soft magnetic material in order to reduce the eddy current loss.

Additionally, JP '322 discloses a surface ratio of not larger than 15 percent (table 1, line 11 and 14). The surface area ratio is: $(4*pi*r^2)_a/(4*pi*r^2)_b$ is <15% which would be reduced to $r^2{}_a/r^2{}_b$< 15% (JP '322).

Applicant claim is for volume ratio which would be reduced to $r^3{}_a/r^3{}_b$< 5 to 50% (applicant). Given that both JP' 322 and applicant considered ratios. One looking at the above relationships would realize that they both obtain a ratio of the radius of a ferromagnetic particle and oxide layer.

JP '322 is using a Fe and Co soft magnetic material (Paragraph 0005, 0006 & 007) surrounded by an insulating matrix (Fe-M-O, Co-M-O) where M is an element easily combined with oxygen (Paragraph 0007). The "M" is disclosed as being Si or Al in the case of Co-M-O. The ratio is considered a result effective variable as the volume ratio (and/or the area ratio) would be changed by the diffusion of oxygen (Paragraph 0031) in determining the desired resistivity. That is, as the oxygen increases the resistivity will increase.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the volume ratio to change the resistivity of the film. In the present invention one would have been motivated to optimize the volume ratio of the insulating organic material in the granular material in the range of 5 to 50% in order to

change the films resistivity. It has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Both JP ‘904 & JP ‘322 are silent regarding the granular substance having an anisotropic magnetic field strength of approximately 50 to 75 Oe.

However, Onuma JP 2002-158486 (JP ‘486) teaches a nanogranular soft magnetic film having a large electrical resistivity, and anisotropic field that has a large absorbing characteristic in the GHz band (see abstract). The nanogranular film provides a mechanism using the magnetic loss of the magnetic body to change the physical relationship of a noise source. When a magnetic body is nearest to a noise transmission line, by giving an equivalent resistance component to a transmission line shows that the high frequency current is controlled [0004]. Fe, Co, and nickel is distributed as a grain boundary substance which consists of any one sort or two sorts or more of insulating materials (as would be found in JP ‘904 & ‘322). Surrounding the ferromagnetic particles is an oxide, a nitride, or fluoride producing a saturation magnetization of 30 or more Oe of anisotropy fields which allows for an electrical specific resistance size of the imaginary part of the complex magnetic permeability in a GHz band [0008] & Table 1.

It would have been obvious to one skilled in the art to utilize the teachings of JP ‘486 nanogranular soft magnetic film having a large electrical resistivity, and anisotropic field of approximately 50 to 75 Oe in order to produce a large absorbing characteristic in the GHz band. One would have been motivated to utilize the granular film to provide a

mechanism using the magnetic loss of the magnetic body to change the physical relationship of a noise source. It would have been obvious to utilize the Fe, Co, and nickel distributed as a grain boundary substance which consists of any one or two sorts or more of insulating materials in order to produce a granular substance with a desired magnetic anisotropic field strength.

As to Claim 2 & 3 Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic having soft magnetic particles (Fe, Co, Ni) (abstract).

JP'904 is silent to a granular substance.

JP '322 discloses a NiFe alloy (Paragraph 0002) and ferromagnetic elements including Fe and Co combined with oxygen to create a granular substance (Paragraph 0007) in obtaining in obtaining an insulating phase as detailed particles (Paragraph 0004).

It would have been obvious to utilize ferromagnetic particles of Fe and Co in order to obtain high specific resistance. One would have been motivated to utilize the granular substance in JP'904 in order to obtain an insulating phase as detailed particles.

As to Claim 4, Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) but does not disclose atomic percentages (abstract).

JP '322 discloses soft magnetic particles made from Fe and cobalt (Paragraph 0014 & 0017) and substituting cobalt into the Fe phase (Paragraph 0020). The Fe

phase Fe3O4 which would be 72 at% (given atomic mass of Fe=55.845 and O=15.994) ZnFe2O4 and MgFe2O4 (Paragraph 0022)). However, JP ‘322 teaches adding a nonmagnetic metal which does not form a solid solution and does not oxidize as easy at a rate below 20 atomic percent (Paragraph 0015 & 0023). JP’322 discloses manipulating the atomic percentage of Fe and Co in avoiding oxidation.

It would have been obvious to one skilled in the art to control the range of Fe and Co from 10 to 50 atomic percentages in order to avoid oxidation. One would have been motivated to use JP’322 to avoid forming a solid solution in the Fe and Co phases.

As to Claim 5, Takeshi et al. JP '904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) and polymer between the particles (spaced apart a distance) that would be capable of exchange coupling (abstract).

As to Claim 6, Takeshi et al. JP ‘904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) and a polymer (nonmagnetic insulating organic material) between the particles (spaced apart a distance) (abstract).

As to Claim 7, Takeshi et al. JP ‘904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) and polymer between the particles (abstract).

JP ‘904 does not disclose the volume ratio.

However, JP ‘322 discloses a soft magnetic granular substance in a nonmagnetic insulating material (Paragraph 0004) having a mean particle size similar to those claimed (Paragraph 0012) in creating a film with high specific resistance and simultaneously reducing the eddy current loss. JP ‘322 discloses a surface ratio of not larger than 15 percent (table 1. line 11 and 14) and forming an insulating phase (Paragraph 0014).

Given that the ferromagnetic particle size is similar (5 to 15nm), the volume ratio would be similar. The ratio is considered a result effective variable as the volume ratio would be changed in determining the desired resistivity. As the volume ratio increases, the material resistivity will change.

Absent unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the volume ratio, since it has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In the present invention one would have been motivated to optimize the volume ratio of the insulating organic material in the granular material in the range of 5 to 40% in order to change the films resistivity. One would have been motivated to utilize a volume ratio in order to form an insulating phase.

As to Claim 8, 9, 10 & 22, Takeshi et al. JP 02-201904 discloses the granular substance has a saturation magnetization of 800G or more (see abstract).

JP 10-189322 discloses a soft magnetic granular substance in a nonmagnetic insulating material (Paragraph 0004) having a mean particle size similar to applicant (Paragraph 0012) and a high saturation magnetization flux density beyond 1.3T (greater than 6kG) in obtaining high specific resistance (Paragraph 0017). The complex permeability at 1 GHz, or the quality factor Q of 1 or more is not disclosed.

Both Takeshi '904 and JP '322 are using a Fe and Co soft magnetic material (Paragraph 0005, 0006 & 007) surrounded by an insulating matrix (Fe-M-O, Co-M-O). Where M is an element easily combined with oxygen (Paragraph 0007). The "M" is disclosed as being Si or Al in the case of Co-M-O.

Given that the materials and size are similar they would have similar complex permeability and quality factor Q as claimed. The claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure at the time of invention, but only that the subject matter is in fact inherent in the prior art reference.

As to Claim 11, Takeshi et al. JP 02-201904 discloses the granular substance has a saturation magnetization of 800G or more (see abstract).

JP '904 is silent to 6kG or more.

JP 10-189322 discloses a soft magnetic granular substance in a nonmagnetic insulating material (Paragraph 0004) having a mean particle size similar to applicant (Paragraph 0012) and a high saturation magnetization flux density beyond 1.3T (greater

than 6kG) in obtaining high specific resistance (Paragraph 0017) while having a low permeability (table 2).

It would have been obvious to require the granular substance to have greater than 6 kG or more in order to obtain a high specific resistance. One would have been motivated to use 6kG or more in order to maintain a low permeability (mu).

As to Claim 12, Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles having 180 micro-ohm-cm or more (abstract).

As to Claim 17, Takeshi et al. JP 02-201904 discloses a granular substance (ferromagnetic particles) and a nonmagnetic insulating organic material (polymer). The ferromagnetic metal particles are dispersed in said nonmagnetic insulating organic material where a deposition of the polymer occurs between the ferromagnetic particles.

JP ‘904 does not disclose the particle size however, the resistivity shown is 180 micro-ohm-cm or more (similar to applicant) (abstract).

JP 10-189322 discloses a soft magnetic granular substance in a nonmagnetic insulating material (Paragraph 0004) having a mean particle size of 10 nm or less (Paragraph 0012) in creating a film with high specific resistance and simultaneously reducing the eddy current loss. It would have been obvious to select ferromagnetic particles from 5 to 15nm in creating a film with high specific resistance while simultaneously reducing the eddy current loss.

Additionally, JP ‘322 discloses a surface ratio of not larger than 15 percent (table 1. line 11 and 14). Given that the ferromagnetic particle size is similar (5 to 15nm) the volume ratio would be similar. The ratio is considered a result effective variable as the volume ratio (and/or the area ratio) would be changed by the diffusion of oxygen (Paragraph 0031) in determining the desired resistivity. That is, as the oxygen increases the resistivity will increase. It should be noted that volume ratio is a result effective variables. As the volume ratio increases, the material resistivity will change. Absent unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the volume ratio since it has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In the present invention, one would have been motivated to optimize the volume ratio of the insulating organic material in the granular material in the range of 5 to 50% in order to change the films resistivity.

Both JP ‘904 & JP ‘322 are silent regarding the granular substance having an anisotropic magnetic field strength of approximately 50 to 75 Oe.

However, Onuma JP 2002-158486 (JP ‘486) teaches a nanogranular soft magnetic film having a large electrical resistivity, and anisotropic field that has a large absorbing characteristic in the GHz band (see abstract). The nanogranular film provides a mechanism using the magnetic loss of the magnetic body to change the physical relationship of a noise source. When a magnetic body is nearest to a noise transmission

line, by giving an equivalent resistance component to a transmission line shows that the high frequency current is controlled [0004]. Fe, Co, and nickel is distributed as a grain boundary substance which consists of any one sort or two sorts or more of insulating materials (as would be found in JP ‘904 & ‘322). Surrounding the ferromagnetic particles is an oxide, a nitride, or fluoride producing a saturation magnetization of 30 or more Oe of anisotropy fields which allows for an electrical specific resistance size of the imaginary part of the complex magnetic permeability in a GHz band [0008] & Table 1.

It would have been obvious to one skilled in the art to utilize the teachings of JP ‘486 nanogranular soft magnetic film having a large electrical resistivity, and anisotropic field of approximately 50 to 75 Oe in order to produce a large absorbing characteristic in the GHz band. One would have been motivated to utilize the granular film to provide a mechanism using the magnetic loss of the magnetic body to change the physical relationship of a noise source. It would have been obvious to utilize the Fe, Co, and nickel distributed as a grain boundary substance which consists of any one or two sorts or more of insulating materials in order to produce a granular substance with a desired magnetic anisotropic field strength.

As to Claim 19, Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) (abstract). JP ‘322 discloses a NiFe alloy (Paragraph 0002) and ferromagnetic elements including Fe and Co combined with oxygen to create a granular substance (Paragraph 0007) in obtaining high specific resistance.

As to Claim 20, Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) and a polymer (nonmagnetic insulating organic material) between the particles (spaced apart a distance) (abstract).

As to Claim 24, Takeshi ‘904 is silent with regard to the magnetic device thin film having a thickness of 100 to 2000 nm.

Fujimori JP ‘322 discloses the thickness in a range set to about 100nm but could be as high as 1micron (1000 nm) (Paragraph 0042). As the thickness increases the resistance increases and provides a magnetic field of 250 Oe. The thickness allows for Rutherford backscattering analysis and analysis of magnetic properties (Paragraph 0043-0048).

It would have been obvious to one skilled in the art to change the thickness in a range from 100nm to 1000 nm in order to vary the resistance of the thin film. One would have been motivated to change the thickness in order to allow the thin film to be analyzed using backscattering techniques and to determine the films magnetic properties.

As to Claim 25, Takeshi ‘904 is silent to a magnetic device characterized in said magnetic device is an inductor which has an insulating film formed on the magnetic thin film and a coil formed on said insulating film.

However Fujimori JP ‘322 discloses a thin film inductor (Paragraph 0001), magnetic devices and noise filters as the soft magnetic material is ideal for response to frequencies in MHz range (Paragraph 0002). The soft magnetic film with granular structure includes a nonmagnetic oxide phase which is carried out to phase separation (which would produce an insulating film) (Paragraph 0009). As the insulating film is increased the saturation magnetic flux density decreases.

It would have been obvious to one skilled in the art to produce a magnetic inductor with an insulating film as taught in Fujimori in order to provide a frequency response in the MHz range. One would have been motivated to use the insulating film as this would further control the saturation magnetic flux density.

Although the coil is not disclosed, it is considered an obvious modification of the apparatus. One of ordinary skill in the art would have recognized inductors used in monolithic microwave integrated circuits (MMIC's), having planar spiral coils are often used (as disclosed by applicant in specification).

Regarding Claim 26 & 27, both JP ‘904 & JP ‘322 are silent to the granular substance & a magnetic device having a complex permeability of approximately 200 at 1 GHz.

However, Onuma JP 2002-158486 (JP ‘486) teaches a nanogranular soft magnetic film having a large electrical resistivity, and anisotropic field that has a large absorbing characteristic in the GHz band (see abstract). The nanogranular film provides

a mechanism using the magnetic loss of the magnetic body to change the physical relationship of a noise source. When a magnetic body is in the nearest to a noise transmission line, by giving an equivalent resistance component to a transmission line shows that the high frequency current is controlled. Depending on the size of the imaginary part (mu") of a magnetic loss clause or complex magnetic permeability, the size of an equivalent resistance component is proportional to the size of mu" mostly here, when the area of a magnetic body is constant. However, since the imaginary part of the amplitude permeability more than GHz was as small as around 10 or less than it, each conventional material needed to set thickness of the shielding material to 1 mm or more, in order to acquire sufficient shielding effect [0004]. The size of the imaginary part of the complex magnetic permeability in a GHz band is related with the electromagnetic-wave-absorbing film made of a nano granular soft magnetism film and is 80 or more [0010] based on the amount of oxide, nitride or fluoride (when the atomic ratio is between 20 and 40 the complex magnetic film is 50 or more in claim 2, 80 or more in Claim 3 and 100 or more in claim 4 which is based on the composition ratio [0014, 0022, 0023, 0034 and Table 1]. The Fe, Co, and nickel is distributed as a grain boundary substance which consists of any one sort or two sorts or more of insulating materials. Surrounding the ferromagnetic particles is an oxide, a nitride, or fluoride producing a saturation magnetization of 30 or more Oe of anisotropy fields which allows for an electrical specific resistance size of the imaginary part of the complex magnetic permeability in a GHz band [0008] & Table 1. The complex magnetic permeability is 100

or more and related to the electromagnetic wave absorbing film [0010-0011] and can be used on various magnetic devices [0036].

It would have been obvious to utilize a granular substance with a complex magnetic permeability of approximately 200 at 1 GHz in a granular substance & a magnetic device based on the composition ratios as taught in JP ‘486. One would have been motivated to change the complex magnetic permeability of approximately 200 at 1 GHz based on the amount of oxide, nitride or fluoride in the soft magnetic material. The granular substance & a magnetic device having a complex permeability of approximately 200 at 1 GHz is a result effective variable. As the oxide changes the permeability changes (see Table 1). See MPEP 2144.05 [R-5].

Claim 21 & 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi et al. JP 02-201904 in view of Fugimori JP 10-189322 A in view of Onuma JP 2002-158486 and further in view of Gay et al. US 5,629,092.

As to Claim 6 & 21, Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles having 180 micro-ohm-cm or more (abstract) but does not disclose the polymer.

However, Gay et al. US 5,629,092 discloses soft ferromagnetic particles coated with Teflon (applicants fluoropolymer) in obtaining high lubricity (Col. 5, Line 62-67, 1-45

respectively). Teflon also has the advantage of not bound to the surface of the iron particles by a polymeric binder (Col. 13, Line 23-38).

It would have been obvious to select a fluoropolymer for the polymer in Takeshi et al. '904 in order to obtain high lubricity. One skilled in the art would have been motivated to use the fluoropolymer in Gay in the Takeshi invention in order to allow the iron particles not to be bound at the surface by a polymeric binder. One of ordinary skill would recognize using a fluoropolymer would enhance exchange coupling interaction in a granular substance.

Response to Arguments

Applicant's arguments filed on 12/28/2010 (in italics) are addressed as follows:

Claims 1 and 17 are amended. New claims 26 and 27 have been added. Claims 1-12, 17 and 19-27 are pending in the application. Support for new claims 26 and 27 can be found on at least page 13 of the specification. Support for the amendments can be found at least at page 14 of the specification and attached Exhibits A and B. No new matter has been added. Reexamination and reconsideration of the application, as amended, are respectfully requested.

The amendment to Claims 1 & 17 contain matter that is not disclosed in the specification, specifically, the upper limit of the anisotropic magnetic field strength.

As a preliminary matter, the applicant would like to thank the Examiner for participating in a telephone interview on December 6, 2010 in which, among other things, the Examiner's obviousness vel non rejection of the present invention was discussed in view of the Takeshi and Fujimori references, taking into account the attached Exhibits A and B. As discussed in the interview, these Exhibits show, respectively, the anisotropic magnetic field strength and magnetic permeabilities of (A) the invention disclosed in Takeshi and (B) the present invention, as calculated using Landau-Liftshitz-Gilbert (LLG) equations. They show that the invention described in Takeshi has an anisotropic magnetic field strength of generally between 7 and 10 Oe and permeability that drops precipitously in the GHz region, whereas

an exemplary embodiment of the present invention has an anisotropic magnetic field strength of around 70 to 75 Oe and permeability that remains high in the GHz region. As discussed during the interview, applicant submits that these Exhibits show unexpected results in overcoming the prior art. The Examiner generally indicated that such evidence of secondary considerations of nonobviousness may be sufficient to put the case in condition for allowance. These Exhibits are discussed further below, and are additionally discussed in the attached sheet providing the conditions used in generating Figures A and B.

The specification does not provide for the new limitation where the granular substance has an anisotropic field strength of approximately 50 to 75 Oe and is considered new matter.

Claims 1-12, 17 and 19-25 stand rejected under 35 U.S.C. § 112, first paragraph as failing to describe "granular ferromagnetic metal particle" in the specification so as to allow one reasonably skilled in the art to "recognize that the ferromagnetic material is a granular ferromagnetic material." Applicant respectfully traverses this rejection.

While applicant believes that its ferromagnetic metal particles are "granular" in that they have a granular shape, i.e., that of a small particle (see Figure 1), Claims 1 and 17 have been amended to delete the term "granular" before "ferromagnetic metal particles" for the sake of clarity. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection.

Applicant's amendment to claims 1 & 17 has overcome the rejection with regard to granular ferromagnetic particles.

Claims 1-12, 17, 19, 20, 22, 24 and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Takeshi et al. (JP 02-201904) in view of Fujimori (JP 10-189322 A). Claims 21 and 23 stand rejected under § 103(a) as being unpatentable over Takeshi in view of Fujimori, further in view of Gay et al. (U.S. Patent No. 5,629,092).

Claims 1 and 17 have been amended to indicate that the granular structure of the present invention has an anisotropic magnetic field strength of approximately 50 to about 75 Oe. As noted above, support for this amendment can be found on at least page 14 of the specification, which provides that the thin film of the present invention "can have a[n] anisotropic magnetic field [strength] of... preferably 50 Oe (3978 A/m) or more, further preferably 70 Oe (5570 A/m) or more." Indeed, as shown more fully in attached Exhibit B, the anisotropic field strength of four exemplary embodiments of the present invention are 75, 70, 70 and 75 Oe respectively.

By contrast, Takeshi fails to disclose magnetic thin films or granular substances with such high anisotropic magnetic field strengths. Indeed, even though the invention disclosed in Takeshi is comprised of ferromagnetic metal particles dispersed within a polymer, attached Exhibit A shows that the anisotropic

magnetic field strengths of the four examples provided tor in Takeshi (see Table 1) are 7, 10, 10 and 80e respectively, which are significantly lower than the anisotropic magnetic field strengths claimed herein. These values were calculated by LLG "equation fitting" using the data for each Example listed in Table 1 of Takeshi. For example, when calculating the anisotropic magnetic field strength of Takeshi's Example 1, the saturation magnetization was assumed to be 1.5 T, the resistivity was assumed to be 180 X 10^{-6} micro ohm cm, the film thickness was assumed to be 5 microns, and the magnetic permeability was assumed to be 2000 at 0.1MHz, as described therein in Table 1.

Fujimori, moreover, does not disclose anisotropic magnetic field strengths for its disclosed magnetic thin films. Accordingly, it, too, does not disclose the claimed feature.

Furthermore, even if Fujimori disclosed anisotropic magnetic field strengths, it would not have been obvious for one skilled in the art to rely on Fujimori to augment the invention disclosed in Takeshi in such a way so as to create the present invention. Fujimori discloses a magnetic thin film that consists of ferromagnetic metal phases and ferromagnetic insulating phases. Indeed, Fujimori provides:

Fujimori at paragraphs 0012-0022. In contrast, the granular substance of claims 1 and 17 essentially consists of ferromagnetic particles and a nonmagnetic insulating organic material. The ferromagnetic insulating phase of Fujimori does not correspond to the nonmagnetic insulating organic material of present claims 1 and 17.

Claims 1 and 17 state that the volume ratio of the nonmagnetic insulating material in the granular substance is in the range of 5 to 50%. The granular substance of the present invention is designed in order for the nonmagnetic insulating organic material to have a suitable thickness between the ferromagnetic particles, and lead to obtain a high resistivity while the exchange coupling between the ferromagnetic metal particles in enabled. |n contrast, Fujimori fails to disclose or suggest how to set the volume ratio of the nonmagnetic insulating material.

Since the magnetic thin film of Fujimori consists of ferromagnetic metal phases and ferromagnetic insulating phases, other magnetic moment interferes with the exchange coupling between the ferromagnetic metal particles. Thus, the mechanism of magnetism in Fujimori is different from that in the present granular substance in which the exchange coupling between the ferromagnetic metal particles is enabled.

Accordingly, one skilled in the art would likely not have considered applying the teachings of Fujimori to Takeshi.

Therefore, claims 1 and 17 are not obvious in light of Takeshi further in view of Fujimori. Claims 2-12 and 19-27, which depend on these claims, are also patentable for at least the same reasons.

Applicant’s arguments regarding Fujimori and Takeshi are moot in regards to the granular substance with an anisotropic field strength of approximately 50 to 75 Oe. Onuma JP 2002-158486 (JP ‘486) teaches a nanogranular soft magnetic film having a large electrical resistivity, and anisotropic field that has a large absorbing characteristic in the GHz band (see abstract). The nanogranular film provides a mechanism using the

magnetic loss of the magnetic body to change the physical relationship of a noise source. When a magnetic body is nearest to a noise transmission line, by giving an equivalent resistance component to a transmission line shows that the high frequency current is controlled [0004]. Fe, Co, and nickel is distributed as a grain boundary substance which consists of any one sort or two sorts or more of insulating materials (as would be found in JP ‘904 & ‘322). Surrounding the ferromagnetic particles is an oxide, a nitride, or fluoride producing a saturation magnetization of 30 or more Oe of anisotropy fields which allows for an electrical specific resistance size of the imaginary part of the complex magnetic permeability in a GHz band [0008] & Table 1.

It would have been obvious to one skilled in the art to utilize the teachings of JP ‘486 nanogranular soft magnetic film having a large electrical resistivity, and anisotropic field of approximately 50 to 75 Oe in order to produce a large absorbing characteristic in the GHz band. One would have been motivated to utilize the granular film to provide a mechanism using the magnetic loss of the magnetic body to change the physical relationship of a noise source. It would have been obvious to utilize the Fe, Co, and nickel distributed as a grain boundary substance which consists of any one or two sorts or more of insulating materials in order to produce a granular substance with a desired magnetic anisotropic field strength.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GARY D. HARRIS whose telephone number is (571)272-6508. The examiner can normally be reached on 8AM - 5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Ruthkosky can be reached on 571-272-1291. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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